



COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF HEALTH

HARRISBURG 17120

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Hydrogeologic Reinvestigation and
Soils Investigation of the
William Dick Lagoons
West Cain Township, Chester County

Carl L. Mease

Assistant Attorney General
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Through: Ground Water Geologist
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Director, Division of
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and

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Chief, Soil Science Unit
Div. of Community Environmental Services

As requested by Mr. Carl L. Mease, Assistant Attorney General of the Office of Legal Counsel, a hydrogeologic and soils field investigation was made on September 29, 1970. Present at the site were Mr. Harry Elston and Mr. Mark Morris of the Chemical Leaman Tank Lines, Inc; Mr. William Dick; Mr. Thomas Cahill of the Chester County Health Department; and Mr. Donald A. Lazarchik, Director of the Division of Industrial Wastes, Harrisburg; Carlyle W. Westlund, Geologist III, Harrisburg; F. Glade Loughry, Chief, Soil Science Unit, Harrisburg; and Richard Pastor, EPS II, Philadelphia, all of the Pennsylvania Department of Health.

The lagoons are located 7.50 inches north and 3.60 inches west of the southeast corner of the Honeybrook 7 1/2 minute quadrangle (1955). For the preliminary geologic and soils investigation refer to the hydrogeologic investigation by Carlyle W. Westlund, dated May 20, 1970.

The present investigation was conducted in fair, cool weather. There are three lagoons in a northeast-southwest alignment. Lagoon #1 is to the southwest with #2 in the middle, and #3 to the northeast. The approximate measurements of the lagoons are as follows: #1 - 135 feet x 117 feet; #2 - 146 feet x 148 feet; and #3 - 164 feet x 247 feet.

Jointing was observed in four outcrops of Chickies Quartzite and the direction of jointing was measured as follows: at outcrop #1, 60 feet north of lagoon #3, measured joints are north 70° east and north 4° west; at outcrop #2, 500 feet northeast of outcrop #1, measured joint is north 70° east; at outcrop #3, 100 feet northeast of outcrop #2, measured joints are north 70° east and north 6° west; and at outcrop #4, 800 feet southwest of lagoon #1, measured joints are north 70° east and north 1° west. The north 70° east joint direction is the dominant joint direction and individual joints are separated by a distance of 2 to 3 feet in the outcrops. The joint set measured from north 1° west to north 6° west is a secondary direction and not as well developed. The joints in this direction vary from 1 to 5 feet apart.

Soil surrounding the lagoons is mapped as Edgemont Channery loam, 3 to 8 percent slopes. It is a well drained, moderately permeable acid soil with low shrink-swell potential.

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Four holes were drilled at appropriate locations with a power auger and several spade slices were used to check the soils. The four auger holes were as follows:

Number 1: In woods 75 feet east of the southeast corner of the third lagoon on 4 to 5 percent slope.

- 0 - 8 inches, A₁, Grayish-brown, fine sandy loam, weak fine granular, friable, non-sticky
- 8 -28 inches, B₂, Yellowish-brown loam, weak subangular blocky structure, friable, slightly sticky
- 28-50 inches, B_c, Light yellowish-brown loam, firm, non-sticky
- 50-58 inches, II_c, Pale yellow silt, non-sticky.

Number 2: South of third lagoon in area of slightly modified soil in secondary catchment area.

- 0 - 4 inches, A₁, Grayish-brown, fine sandy loam, weak fine granular, friable, non-sticky
- 4 -28 inches, B₂, Dark yellowish-brown loam, weak subangular blocky, friable
- 26-29+inches, B_c, Pale yellow fine sandy loam, friable, non-sticky.

Number 3: Borrow area south of third lagoon at edge of silted area in emergency retention basin, surface soil removed.

- 0 -15 inches, B, Yellowish-brown loam, weak subangular blocky, friable, slightly sticky.
- 15-18+inches, B_c, Pale yellow fine sandy loam, friable.

Number 4: In woods west of lane south of lagoons on 6 percent slope.

- 0 - 8 inches, A, Grayish-brown loam, weak fine granular, friable
- 8 -34 inches, B, Yellowish-brown loam, weak subangular blocky, friable, slightly sticky
- 34-36+inches, B_c, Pale yellow silt loam, friable, non-sticky.

Several shallow spade pits on the crest of the ridge northwest of the lagoons show the soil in this area to be more sandy than the soil on the slope. It is yellowish-brown sandy loam that is at the coarse extreme of the range of the Edgemont Series.

The Edgemont Soil in the areas south and east from the lagoons is suitable for disposal of waste water by spray irrigation if the water can be freed of the surface oil and the latex material that would be retained on the surface.

Summary and Conclusions: The soils in the lagoon area are Edgemont Channery, well drained with moderate permeabilities. The bedrock is the Chickies Quartzite with a well developed north 70° east joint set with individual joints 2 to 3 feet apart and a fairly well developed north 10-60° west joint set with individual joints 1 to 3 feet apart. The combination of well drained soils and densely jointed bedrock results in seepage from the base of the lagoons into the bedrock to ground water. Spray irrigation potential exists in the Edgemont Soil in the areas south and east of the lagoons. The waste material needs to be tested to prove it is not toxic or contain compounds that could not be renovated and would pollute ground water.

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CWW:lks

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